

Carb Class: 5 Basic Carb Tuning Tips

Quick Fuel Technology® (QFT™) ships carburetors only after they have been thoroughly run-tested and adjusted on a typical engine. Engine testing all carburetors prior to shipment ensures that when a new QFT™ carb is bolted on an engine, it will start, idle and perform up to the customer's expectations. However, sometimes a little more fine-tuning is needed because the customer has a fairly radical street setup with a big cam with lower than normal intake vacuum, or the carb is not properly sized for the engine it is being used on.

There are many misconceptions about how to go about these adjustments, and of course there is no shortage of free advice. So we went to Zach Baker, a technician at QFT that spends much of his time talking customers through the correct tuning procedures, to give us his proven step-by-step carb tuning tips to get the most out of your carburetor's performance. Following these step-by-step tuning tips are necessary to make sure that your engine runs at peak performance. Along with these tuning tips, a check of your ignition system, as well as, the mechanical and vacuum advance curves in your distributor is suggested to eliminate any potential timing and ignition problems.

Step 1 –

Fuel pressure has a big effect on how well a carb works. QFT™ recommends an optimum fuel pressure of 6.5psi, (Maximum pressure of 7psi). But if your vehicle has an adjustable pressure regulator, set it for the ideal 6.5psi. The proper way to check fuel pressure is with the engine running at idle with the engine up to full operating temperature. It is worth mentioning that the fuel pressure gauge should be installed on the outlet side of the regulator as close to the carburetor as possible.



Step 2 –

Next, the float level adjustment can be checked and adjusted if necessary. QFT™ equips its carbs with large sight glass windows right in the side of its fuel bowls, so it is easy to check the fuel/float level. The way to do this is to have your vehicle on level ground and with the engine running at an idle. The fuel level should be exactly half way up the window. To adjust the fuel level, first shut the engine off, loosen the locking screw and adjust the large nut that raises and lowers the float on the top of the bowl.

NOTE:

Adjusting fuel pressure with the engine running could cause a fire hazard.

After you lock down the screw you can start the engine and re-check the fuel level. If you need a minor adjustment, be sure to shut the engine off and go through the adjustment procedure again.



Step 3

– Now you are ready to check and re-set the idle mixture screws. Again, the vehicle must be up to operating temperature and check to see if your fuel pressure is holding at 6.5psi and the float level is still correct.

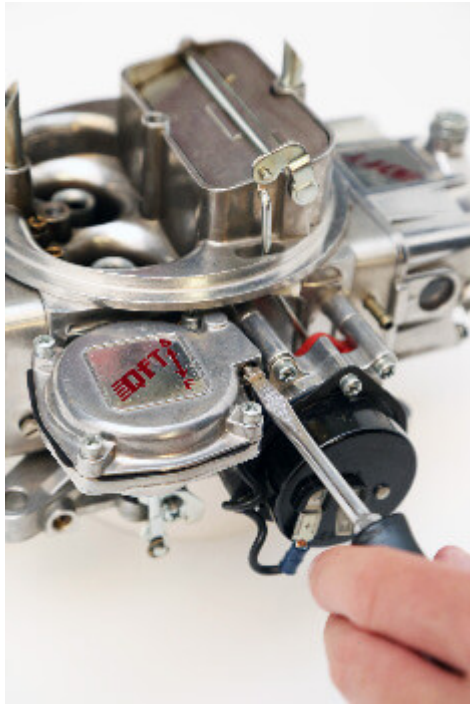
Regardless if you have a two- or four-corner idle adjustment on your QFT™ carb, start by setting all of the idle adjustment screws the same (1-1/4 turns from bottomed out in the metering block is a good place to start). The engine should be turned off while you are setting the adjustment on all of the screws. Start the engine and turn one of the idle screws in or out. What you are looking for is an increase or decrease in rpm. Make these adjustments 1/4 turn at a time. If engine speed increases with that one screw, adjust all of the others to match. If the engine decreases rpm when you are adjusting the others, take them all back to the original setting, because the settings were already correct. However, if engine rpm stays consistent or increases when you equalize the remaining screws, make another 1/4 turn adjustment on the first screw and adjust the others to match. After you have attained the highest rpm possible, you might have to turn down the idle adjustment on the throttle linkage to get the correct idle speed you want.



Step 4 –

Next determine if you have the correct power valve for your vehicle's application. That is primarily determined by the amount of engine vacuum available at idle. A good rule of thumb is that if a QFT™ carb has a choke it comes with a 6.5 power valve. If your QFT™ doesn't have a choke it probably has a 4.5 power valve from the factory.

To check manifold vacuum, attach a vacuum gauge to the manifold vacuum port on the carburetor, place foot on brake, engage in gear and record the reading. The rule of thumb is that the power valve rating (opening point) should be $\frac{1}{2}$ the manifold vacuum at idle, tested in the manner described above. So if you get a 12-inches of vacuum reading, you need a #6 power valve. If your vehicle makes 6-inches of manifold vacuum at idle, then you need a #3 power valve. **Caution: make sure you are using a tested, known power valve. Don't just stick any old power valve in your carburetor.** QFT™ uses a patented "Four-Door" power valve that is calibrated to flow more fuel and respond more quickly to changes in manifold vacuum.



Step 5 –

One of the most overlooked carburetor issues has to do with the secondary throttle opening. If the secondary throttle opens too soon, the engine is more likely to bog. Open the secondaries too late, and you are missing the true performance potential of your carb and engine. Vacuum secondary carbs control secondary opening with venturi vacuum opposing a diaphragm and spring. Mechanical secondary carbs use a direct link to the secondary throttle shaft. The opening rate on mechanical secondary carbs can be changed with QFT's Quick-Link™ system that provides three links for a 40%, 60% and a one-to-one opening rate. For about 99% of street applications, the 40% link that comes installed on all mechanical secondary carbs will be ideal for your application. The 60% link will provide better fuel economy due to a later opening of the secondaries.

Setting opening rates for vacuum secondary carburetors is really important to the overall performance of the vehicle, and with QFT's Quick-Set™ adjustable secondary housing assembly the task is very simple. However, setting the vacuum secondary opening point requires trial and error road testing of the vehicle. A good place to start is with the factory setting or 1/2-turn out on the adjustment screw. If the secondary side opens too quickly the engine will bog. If the engine doesn't hesitate or bog under acceleration, the secondaries could be opening too late. To determine where the correct opening point is, you need to keep adjusting the screw out until you get a bog, then turn the screw in 1/4-turn. When making adjustments 1/4-turn at a time is a good way to proceed. Turning the screw "in" slows the opening rate, turning it "out" makes the secondaries open sooner. Regarding mechanical secondary carburetors, if a bog exists, it will be necessary to

adjust the squirter size to compensate. For a lean condition, go to a larger squirter size; if the engine is running on the rich side, go to smaller squirter size.

Bonus Tuning Tips –

The information supplied above should get your carburetor and engine in sync and pretty happy with each other. But there are a couple of other points worth mentioning. Depending upon what altitude you live at (sea level in LA or at 5,000 feet in Denver) your carb may need a main jet change. The rule of thumb is for every 5000 ft. change in elevation, compensate by 3 jet sizes. Typical highway driving is done on the main circuit of the carb where the air/fuel ratio is largely determined by the main jets. So, you might want to check your air/fuel ratio at cruise with one of the many hand-held air/fuel ratio devices or gauges currently available. Another indication if the main jets are correct is how the car drives. If it surges, it is probably lean and will require jetting up. If it feels lazy and non responsive to slight changes in the throttle, it may be too rich and will require jetting down. After a long stretch of steady-state highway driving pull off in a rest area and check the tailpipes. If they are black, your jetting is too rich. If they are white, you're probably too lean. If your tailpipes are a light tan, you are probably in the ballpark.

Once you get the main jetting where you want it, it will probably be too lean for full throttle, full power runs. That's where the power valve circuit comes in. There is one more adjustment left after you establish the correct power valve opening point. The screw-in power valve channel restrictors act as jets for the power valve circuit. So, if your vehicle is surging or coughing through the carb (popping) at wide-open throttle, you can richen it up with larger restrictors. Zach says that .005" change in size will be a noticeable difference. Most QFT™ carbs come from the factory with .043"-.048" power valve channel restrictions. If the main jets feel right and the engine is too rich under full throttle, then you can also reduce the size of the channel restrictions.

Carburetors are amazing mechanical devices. Once you understand them, you can spend many enjoyable hours perfecting the fuel curve for your engine combination. It's hard to imagine anything more satisfying for a diehard gearhead.
